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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/669,713

09/25/2003

Satoru Fukuoka

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02/06/2008

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EXAMINER

ECHELMEYER, ALIX ELIZABETH

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

02/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/669,713

Applicant(s)

FUKUOKA ET AL.

Examiner

Alix Elizabeth Echelmeyer

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/ are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed November 15, 2007.
Claim 1 has been amended. Claims 1 and 3-5 are pending and are rejected finally for the reasons given below.

Claim Rejections - 35 USC § 112

2. The rejection of claim 1 under 35 U.S.C. 112, second paragraph, is withdrawn in light of the amendment.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamrock et al. (US 6,063,522) in view of Sano et al. (US 2002/0086191) and Funatsu (US 5,478,673).

Regarding claim 1, Hamrock et al. teach a non-aqueous electrolytic solution for a lithium cell containing linear ethers such as diethylene glycol dimethyl ether (DMG) (column 13 lines 52-59).

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As for applicants' claim 3, Hamrock et al. teach the use of conductive salts in the electrolyte composition (column 11 lines 45-50). Hamrock et al. list lithium bis (trifluoromethanesulfonyl) imide and lithium bis (pentafluoroethanesulfonyl) imide as preferred conductive salts (column 13 lines 20-25).

Regarding claims 4 and 5, Hamrock et al. teach $\text{Li}_x\text{Mn}_2\text{O}_4$ and Li_xMnO_2 as suitable cathode materials (column 14 lines 49-51).

Regarding claim 1, Hamrock et al. fail to teach the use of a separator having a melting point greater than 185 degrees Celsius.

Sano et al. teach the use of a separator in a battery cell that is capable of withstanding high temperatures ([0015]). Sano et al. teach that polyphenylene sulfide may be used as the separator, the same material used as the separator in the specification of the instant invention (claim 4 of Sano et al.).

Sano et al. further teach that the separator would be capable of withstanding high temperatures in order to suppress the vaporization of the electrolyte ([0015]).

It would be desirable to use the polyphenylene sulfide separator of Sano et al. in the battery of Hamrock et al. in order to suppress the vaporization of the electrolyte.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polyphenylene sulfide separator of Sano et al. in the battery of Hamrock et al. in order to suppress the vaporization of the electrolyte.

With further regard to claim 1, Hamrock et al. fail to teach a subsidiary component of the non-aqueous electrolyte in the amount of less than 100% by volume.

Funatsu teaches a non-aqueous electrolyte battery having a mixed solvent containing ethylene carbonate and a chain ether (abstract).

The mixed solvent of Funatsu contains 5%-40% ethylene carbonate and 60%-95% of the chain ether (column 3 lines 15-30).

Funatsu further teaches that the mixed solvent improves charge/ discharge capacity by preventing dendrite growth (column 3 lines 7-15).

It would be advantageous to use the blended solvent of Funatsu in the battery of Hamrock et al. in view of Sano et al. since it increases the charge/discharge capacity of the battery by preventing dendrite growth.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the blended solvent of Funatsu in the battery of Hamrock et al. in view of Sano et al. since it increases the charge/discharge capacity of the battery by preventing dendrite growth.

Response to Arguments

5. Applicant's arguments filed November 15, 2007 have been fully considered but they are not persuasive.

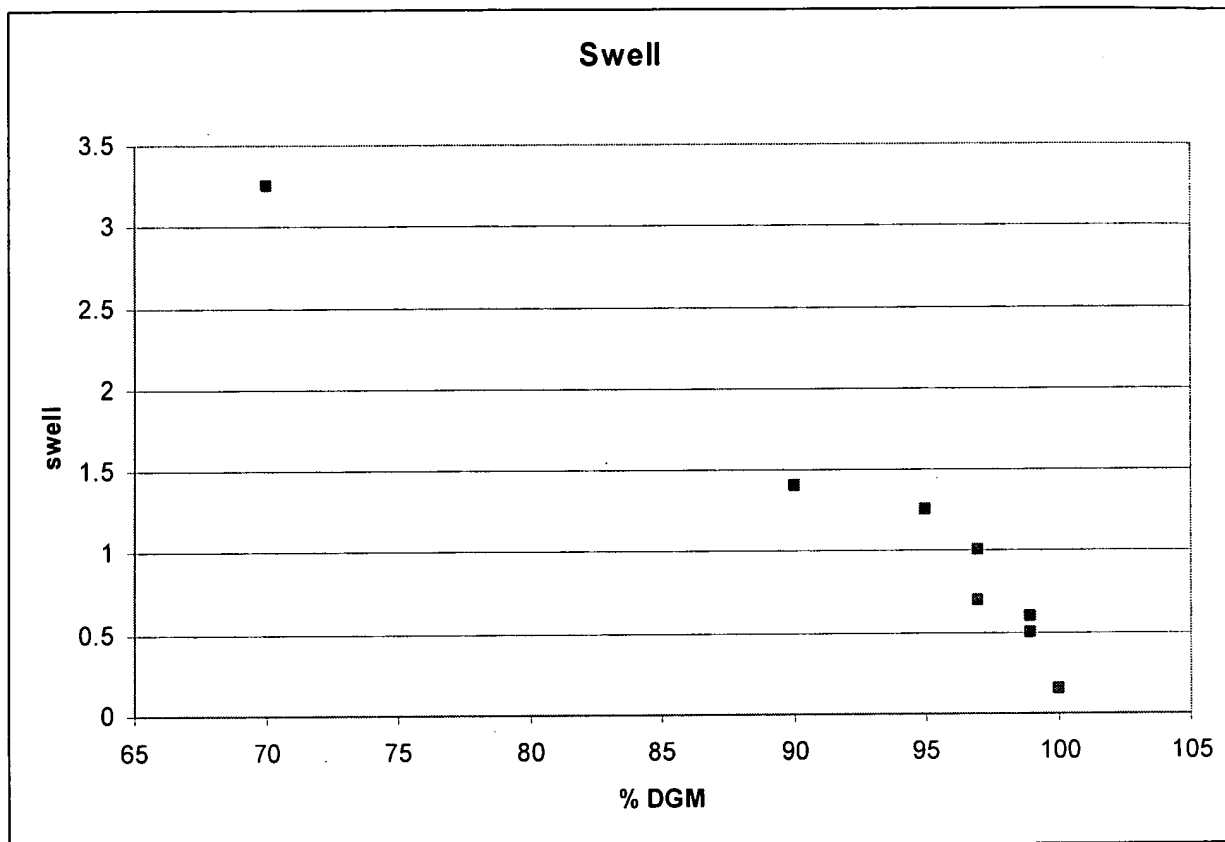
Applicant argues that Funatsu fails to teach a chain ether of the general formula found in the claim, where n is 2 or 3. The examiner agrees that Funatsu does not teach this limitation; however, Hamrock et al., the base reference used in the above rejection,

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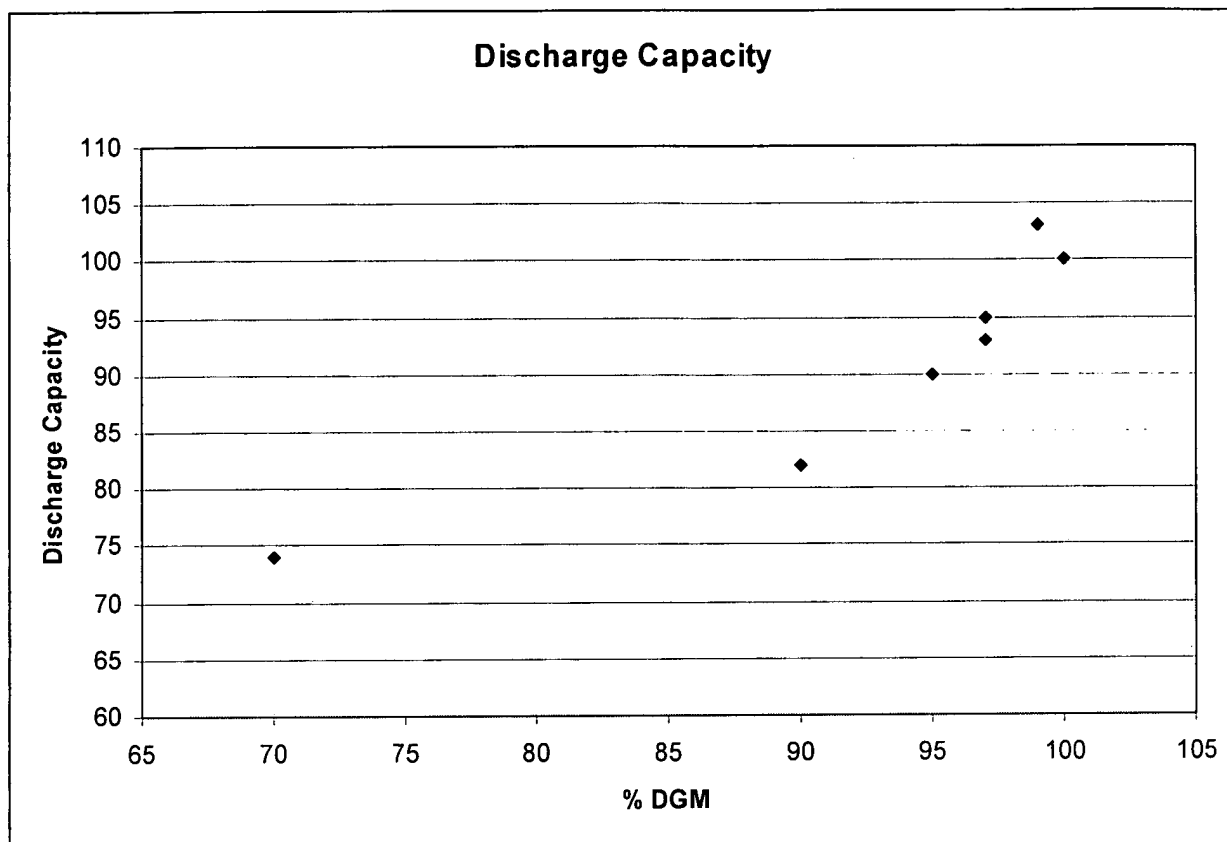
does. As stated previously, Hamrock et al. teach a non-aqueous electrolytic solution for a lithium cell containing linear ethers such as diethylene glycol dimethyl ether (DMG) (column 13 lines 52-59). In response to these arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Additionally, Applicant argued that the instantly claimed range yields unexpected results. The examiner disagrees. The data cited by Applicant fail to provide evidence of the alleged unexpected results. Applicant references Table 2 (on page 15 of the instant specification). The following charts were made using the data from Table 2:

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In both plots, it appears that the data points follow a generally linear trend.

Additionally, in neither plot is there found a significant change in the data trends, which would be indicative of unexpected results. Finally, the data points do not cover enough of the area just outside the claimed range, e.g. 85-90%, to show a significant change in data associated with unexpected results.

Applicant further argues that, since none of the specific examples of Funatsu disclose the overlapping range, then Funatsu does not teach the range. This is completely unconvincing. Following Applicant's argument, since Applicant's examples only cover DGM and PC or EC, then Applicant does not have coverage for any other compounds falling within the formula (1) found in claim 1.

Applicant further states that "the art of Funatsu relates to prevention of dendrite growth and to improvement of charge-discharge characteristics" (p. 7), while the instant invention "aims to improve reliability under the sever circumstance of high temperature." The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

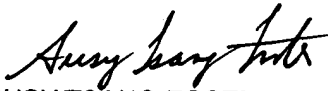
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1795

aee


SUSY TSANG-FOSTER
SUPERVISORY PATENT EXAMINER